UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/578,644	04/17/2007	Peter Klaus Bachmann	DE 030388	1509

24737 7590 01/20/2010
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510

EXAMINER	
SWANSON, WALTER H	

ART UNIT	PAPER NUMBER
2823	

MAIL DATE	DELIVERY MODE
01/20/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/578,644	BACHMANN ET AL.	
	Examiner	Art Unit	
	WALTER H. SWANSON	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15,19 and 20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15,19 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 May 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to the Appeal's Arguments

This is in response to the appeal brief filed 24 June 2009.

In view of the appeal brief filed on 24 June 2009, PROSECUTION IS HEREBY REOPENED. A **non-final** rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office Action is final); or

(2) initiate a new appeal by filling a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Matthew S. Smith/

Supervisory Patent Examiner, Art Unit 2823

Remarks

Claims 15 and 20 have been amended.

Claims 16-18 have been cancelled.

Drawings

New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because of the following reason(s):

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, "… an adhesion layer between the first barrier layer of a first amorphous carbon modification and the electroluminescent diode must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Applicants are advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

Claim Objections

Claims 13 and 20 are objected to because of the following informalities:

Claim 13 recites, *inter alia*, "… the electroluminescent diode." An electroluminescent diode is not described in claim 1.

Claim 20 recites, *inter alia*, "A method as claimed in claim 20, …." Claim dependency is not proper because a dependent claim cannot depend on itself.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

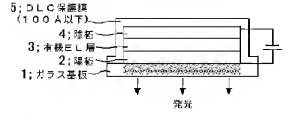
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 14, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Motomatsu (Japanese Patent Application Laid-Open (*Kokai*) No: 2000-133440; hereinafter, "**Motomatsu**" previously cited).

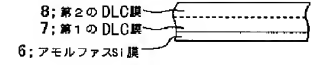
RE claim 1, Motomatsu discloses an electronic device comprising a protective barrier layer stack comprising a first barrier layer of a first amorphous carbon modification (7) and a second barrier layer (8) of a second amorphous carbon modification (amended claims 1-14; FIGS. 1, 2 (amended) and related text; regarding amorphous state of DLC films, see provided chart of amorphous carbon films (DLC) by Fraunhofer).

【図１】



No.	KEY TO FIGURE 1
5	DLC Protective Barrier Film (100 Å or less)
4	Anode
3	Organic Electroluminescent Layer
2	Cathode
1	Glass Substrate

【図２】



No.	KEY TO FIGURE 2
8	Second DLC Film
7	First DLC Film
6	Organic Electroluminescent Layer (α-Si)

Thus, Motomatsu anticipates this claim.

RE claim 2, Motomatsu discloses an electronic device according to claim 1, wherein the electronic device is an organic electroluminescent device (amended claims 1-14; FIG. 1 and related text).

Thus, Motomatsu anticipates this claim.

RE claim 3, Motomatsu discloses an electronic device according to claim 1, wherein the first (7) and the second (8) amorphous carbon modification are selected from the group of amorphous carbon modifications comprising amorphous carbon, tetrahedral amorphous carbon, hydrogenated amorphous carbon, tetrahedral hydrogenated amorphous carbon, diamond-like-carbon, and glassy carbon (amended claims 1-14; FIGS. 1, 2 (amended) and related text).

Thus, Motomatsu anticipates this claim.

RE claim 14, Motomatsu discloses an electronic device according to claim 1, comprising a top layer lying on and in contact with the second barrier of a second carbon modification (amended claims 1-14; FIGS. 1, 2 (amended) and related text).

Thus, Motomatsu anticipates this claim.

RE claim 19, Motomatsu discloses a method of fabricating an electronic device comprising an electroluminescent diode, the method comprising:

forming a protective barrier layer stack (7, 8), the forming comprising:

depositing a first amorphous carbon modification from a gas phase (carbon protective film 7 adhered to amorphous silicon base film 6); and

depositing a second amorphous carbon modification (8 formed on 7) from a gas phase (amended claims 1-14; FIGS. 1, 2 (amended) and related text).

Thus, Motomatsu anticipates this claim.

Claim Rejections – 35 USC § 103

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows (Graham Factors):

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5-9, 12, 15, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu.

RE claim 5, Motomatsu discloses a DLC protective barrier film composed of multiple amorphous carbon modification barrier films.

Motomatsu is **silent** regarding the plasmon energy of the amorphous carbon modification barrier films.

However, notwithstanding, one of ordinary skill in the art would have been led to the recited dimensions through routine experimentation and optimization. Applicants have not disclosed that the dimensions are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process would possess utility using another dimension. Indeed, it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical.

RE claims 6-9, Motomatsu is **silent** regarding the first and second amorphous carbon modifications being selected from the group of amorphous carbon modifications having a refractive index n>1.8; having a refractive index n>2.0; the first barrier layer of a first amorphous carbon modification having a first refractive index and the second barrier layer of a second amorphous carbon deification having a second refractive index higher than the first refractive index; and the first barrier layer of a first amorphous carbon modification having a first refractive index n1>1.8 and the second barrier layer of a second amorphous carbon modification having a second refractive index n2>2.0.

However, notwithstanding, one of ordinary skill in the art would have been led to the recited dimensions through routine experimentation and optimization. Applicants have not disclosed that the dimensions are for a particular unobvious purpose, produce an unexpected

result, or are otherwise critical, and it appears *prima facie* that the process would possess utility using another dimension. Indeed, it has been held that mere dimensional limitations are *prima facie* obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical.

RE claim 12, Motomatsu discloses the claimed invention except for the second amorphous carbon modification comprising at least 10 % hydrogen bound to the carbon atoms. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the second amorphous carbon modification comprising at least 10 % hydrogen bound to the carbon atoms, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233 (CCPA 1955).

RE claim 15, Motomatsu discloses an electronic device as claimed in claim 1, wherein the layer thickness of the barrier layer stack $\geq$ 30 nm". The prior art of Motomatsu discloses a barrier layer stack d > 100 nm, FIG. 5 and related text).

Motomatsu discloses the claimed invention except for the lesser end of the barrier layer stack thickness range of d $\geq$ 30 nm. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the lesser end of the barrier layer stack thickness range at d $\geq$ 30 nm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233 (CCPA 1955). MPEP Chapter 2100, § 2144.05 Optimization of Ranges. A *prima facie* case of obviousness typically exists when the ranges of a claimed composition overlap the ranges disclosed in the prior art. E.g., *In re Geisler*, 116 F.3d

1465, 1469, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (CCPA 1976); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974). Such is the case here.

RE claim 20, discloses the method as claimed in claim 20 [*sic*], wherein the depositing comprises a radio frequency (RF) plasma chemical vapor deposition (CVD) (pp. 9-15; amended claims 1-14; FIGS. 1, 2 (amended) and related text – for examination purposes, claim 20 is interpreted as depending on claim 19).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu in view of Murazaki *et al.* (Japanese Patent Application Laid-Open (*Kokai*) No: 2003-178867 A; hereinafter, "**Murazaki**" previously cited).

RE claim 4, Motomatsu is **silent** regarding doped amorphous carbon modifications, wherein the dopant is selected from the group of boron, silicon, nitrogen, phosphorus, oxygen, and fluorine.

Murazaki **teaches** doped amorphous carbon modifications, wherein the dopant is selected from the group of boron, silicon, nitrogen, phosphorus, oxygen, and fluorine (col. 2, [0011], Table 1 and related text).

It would have been obvious to one of ordinary skill in the art to modify Motomatsu by doping amorphous carbon modifications, wherein the dopant is selected from the group of boron, silicon, nitrogen, phosphorus, oxygen, and fluorine as taught by Murazaki. This is so because compared to undoped DLC protective barriers, doped DLC protective barriers have superior adhesive and protective properties (*see* Murazaki col. 2, [0011]). Furthermore, it would have

been obvious because all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. *KSR International Co. v. Teleflex Inc. (KSR)*, 550 U.S. 398 (2007). "If a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond that person's skill." *Id.*

Claims 10, 11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motomatsu in view of Jones (US 5,920,080; hereinafter, "**Jones**" previously cited).

RE claim 10, Motomatsu is **silent** regarding an interlayer between the first barrier layer of a first amorphous carbon modification and a second barrier layer of a second amorphous carbon modification.

Jones **teaches** an interlayer (545, 546) between the first barrier layer (542) of a first amorphous carbon modification and a second barrier layer (541) of a second amorphous carbon modification (FIG. 7 and related text).

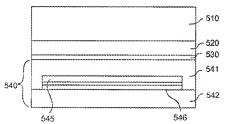


FIG. 7

It would have been obvious to one of ordinary skill in the art to modify Motomatsu by forming an interlayer between the first barrier layer of a first amorphous carbon modification and

a second barrier layer of a second amorphous carbon modification as taught by Jones. This is so because getter material layers such as dielectrics Si_3N_4, SiO, and SiO_2, are capable of removing moisture (*see* Jones col. 10, lines 6-17). Furthermore, it would have been obvious because all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. *KSR International Co. v. Teleflex Inc. (KSR)*, 550 U.S. 398 (2007). "If a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond that person's skill." *Id.*

RE claim 11, Motomatsu discloses an electronic device according to claim 10, wherein the interlayer comprises a polymer selected from the group of parylenes, benzocyclobutanes, polyimides, fluorinated polyimides, poly(arylene ethers), poly(naphthalenes), poly(norbones), fluoropolymeres (e.g. PTFE), chlorofluoropolymeres(PCFP), and hydrocarbons. Motomatsu discloses the limitations noted above but is **silent** regarding this limitation.

Jones discloses the claimed invention except for forming an interlayer comprising a polymer selected from the group of parylenes, benzocyclobutanes, polyimides, fluorinated polyimides, poly(arylene ethers), poly(naphthalenes), poly(norbones), fluoropolymeres (e.g. PTFE), chlorofluoropolymeres(PCFP), and hydrocarbons. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form an interlayer comprising a polymer selected from the group of parylenes, benzocyclobutanes, polyimides, fluorinated polyimides, poly(arylene ethers), poly(naphthalenes), poly(norbones),

fluoropolymeres (e.g. PTFE), chlorofluoropolymeres (PCFP), and hydrocarbons; since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416 (CCPA 1960).

RE claim 13, Motomatsu is **silent** regarding an adhesion layer between the first barrier layer of a first amorphous carbon modification and the electroluminescent diode.

Jones **teaches** an adhesion layer between the first barrier layer of a first amorphous carbon modification and the electroluminescent diode (FIG. 7 and related text).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter H. Swanson whose telephone number is (571) 270-3322. The examiner can normally be reached on Monday to Thursday from 7:00 to 19:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Walter H. Swanson/

14 January 2010

/Matthew S. Smith/
Supervisory Patent Examiner, Art Unit 2823